

# Taxonomic Notes on *Cimicifuga purpurea*, Stat. Nov. (Ranunculaceae)

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**ABSTRACT.** Examination of type specimens and other collections of *Cimicifuga acerina* f. *purpurea* and forma *strigulosa* revealed that they are not separable from one another but are very distinct from *C. acerina* and other related species of the genus in many morphological characters, including sepal color, stamen number, anther structure, and presence of cauline leaves. Therefore, these two formae are combined and recognized here as a distinct species, *C. purpurea*.

The genus *Cimicifuga* L. (Ranunculaceae) consists of ca. 18 species (Tamura, 1966, 1990) that usually occupy shady, moist habitats in rich mountain woods. The species of *Cimicifuga* are distributed in temperate to cold temperate regions of the Northern Hemisphere including Europe, Asia, and North America, with the center of diversity in eastern Asia. They are readily distinguished by their large ternately compound leaves that are long-petioled, racemose or paniculate inflorescences bearing many small flowers, and follicular fruits with 4 to 15 seeds (Ramsey, 1965; Tamura, 1966, 1990).

Hsiao (in Wang & Hsiao, 1965) described four formae of *C. acerina* (Siebold & Zuccarini) Tanaka from China on the basis of differences in leaf pubescence and sepal color; these include f. *acerina*, f. *hispidula*, f. *purpurea*, and f. *strigulosa*. During a comprehensive systematic study of the genus *Cimicifuga*, we examined the type specimens and other collections of forma *purpurea* and forma *strigulosa* and found that they are very distinct from *C. acerina* (= *C. japonica* (Thunberg) Sprengel; see Hara (1985)) in having purple sepals, five to eight stamens with dorsifixed and introrsely dehiscent anthers (Fig. 1A–C), somewhat elongated styles with narrowly capitate stigmas (Fig. 1D), and cauline leaves. Furthermore, the stamen number of forma *purpurea* and forma *strigulosa* is significantly lower than that of all other species in the genus, which usually have 20 to 70 stamens. In addition, anthers are usually basifixed and latrorsely dehiscent in other species of the genus.

Although Hsiao (in Wang & Hsiao, 1965) stated

that forma *strigulosa* differs from forma *purpurea* in having strigulose leaves, it does not seem to be consistently distinguishable by any characters other than leaf pubescence, which shows variation and some degree of overlap. Therefore, it can hardly be considered as distinct from forma *purpurea*, and we believe that they should be united.

Based on the above observations, it is concluded that the appropriate taxonomic treatment regarding forma *purpurea* and forma *strigulosa* is to combine them and to raise the combined taxon to species rank. Since these names were published simultaneously by Hsiao (in Wang & Hsiao, 1965) and since their synonymy has not been previously recognized, we have selected the name forma *purpurea* (Article 11.5 of ICBN (Greuter et al., 1994)) as a basionym for this species, as the distinguishing characters mentioned above seem to be correlated with purple sepals. The necessary nomenclatural change, along with an expanded description, is provided here in advance of our monograph of the genus to make it available for use in the forthcoming paper on pollen morphology of the genus *Cimicifuga*.

***Cimicifuga purpurea*** (Hsiao) Park & Lee, stat. nov. Basionym: *Cimicifuga acerina* (Siebold & Zuccarini) Tanaka f. *purpurea* Hsiao in Wang & Hsiao, Acta Phytotax. Sin. 12 (Addit. 1): 54. 1965. TYPE: China. "Shan-si, Yuan-chü," 28 Aug. 1959, S. Y. Pao 681 (holotype, PE).

*Cimicifuga acerina* (Siebold & Zuccarini) Tanaka f. *strigulosa* Hsiao in Wang & Hsiao, Acta Phytotax. Sin. 12 (Addit. 1): 55. 1965. Syn. nov. TYPE: China. "Shen-si, Shan-yang, Tien-chu-shan," alt. 1400 m, 5 Sep. 1952, T. P. Wang 16488 (holotype, PE).

Erect rhizomatous perennial herb, 0.5–1.1 m tall; rhizomes thick, knotted, ca. 5 cm long, bearing numerous fibrous roots. Stem unbranched, thick, glabrous or sparsely pubescent with simple filiform unicellular hairs. Leaves basal and cauline, ternately compound with 3 relatively large leaflets, long-petioled. Basal leaves 1 or 2; terminal leaflet orbicular, 13.3–20.0 cm long, 9.5–21.4 cm wide,

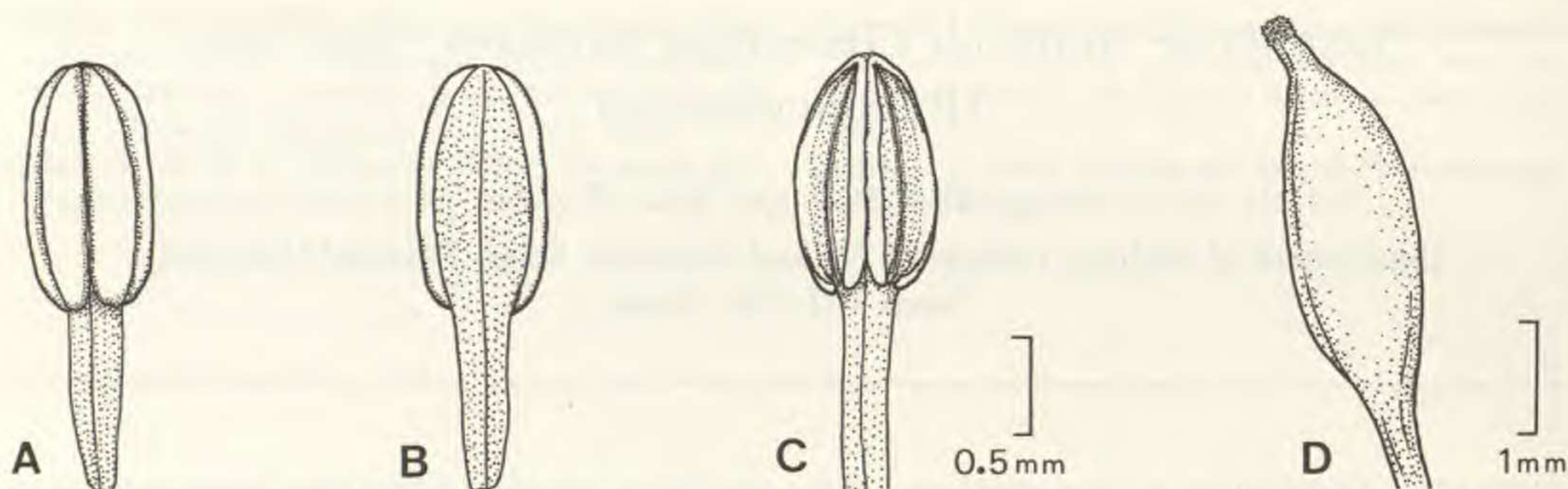


Figure 1. Stamen (A–C) and pistil (D) of *Cimicifuga purpurea* (Hsiao) Park & Lee. —A. Ventral view. —B. Dorsal view. —C. After anthesis (ventral view). —D. Pistil with an elongated style and narrowly capitate stigma. (A, B drawn from *Liou 3509* (PE); C, D from the holotype specimen, *Pao 681* (PE)).

palmately 5- to 9-lobed, lobe tip acuminate to weakly cuspidate, base weakly to deeply cordate, margin irregularly double serrate; teeth acute, gland-tipped; upper surfaces green, with a narrow zone of somewhat appressed short simple filiform unicellular hairs to 0.5 mm long along margin; rest of upper surface usually glabrous, but rarely sparsely to moderately pubescent with simple filiform unicellular hairs; lower surfaces light green, sparsely to densely pubescent with simple filiform unicellular hairs along major veins; major veins 5–9, equal to number of lobes, prominent, joining at base of leaflet; petiolules 9–15 cm long, grooved, glabrous or sparsely pubescent with simple filiform unicellular hairs ca. 0.5 mm long; lateral leaflets 2, similar to terminal one, but often slightly smaller and inequilateral. Petioles of basal leaves 11–23 cm long, grooved, glabrous or sparsely pubescent with simple filiform unicellular hairs ca. 0.5 mm long. Cauline leaves usually 1, similar to basal ones in shape, but smaller. Inflorescence a terminal, spikelike raceme with many small flowers, often bearing 1–6 branches near base, indeterminate, densely pubescent with simple saccate unicellular hairs to 0.3 mm long; terminal raceme 10–21 cm long; pedicels very short, ca. 0.5 mm long, bearing bracteoles at base; bracteoles 3, triangular, acute, middle one 1.0–1.5 mm long, 1.0 mm wide, 2 lateral ones similar in shape but smaller. Flowers bisexual, small, actinomorphic; sepals 5, petaloid, purple, broadly elliptic, concave, 3.2–4.5 mm long, 2.0–2.6 mm wide, glabrous, caducous, apex obtuse; petal 1, broadly elliptic to ovate, dark brown when dry, 2.5–3.5 mm long, 2.0–2.4 mm wide, apex obtuse, base short-stipitate, glabrous, bearing a nectariferous area near base; stamens 5–8; filaments filiform, somewhat flattened, glabrous, 1.0–4.0 mm long, dark brown when dry, elongate considerably and exerted after anthesis; anthers bilocular, nar-

rowly elliptic to oblong, 1.1–1.6 mm long, 0.6–1.0 mm wide, dorsifixed, longitudinally and introrsely dehiscent; pistils 1 or 2, elliptic, glabrous, 2.0–3.1 mm long, 0.8–1.4 mm wide; style 1, somewhat elongated, ca. 0.2 mm long; stigma 1, narrowly capitate, 0.2–0.3 mm wide; stipe 1.0–1.2 mm long, elongate after fertilization. Mature follicles and seeds not seen.

*Distribution.* North central China, including Hebei, Hubei, Shaanxi, Shanxi, and Sichuan provinces.

*Additional specimens examined.* CHINA. “Prov. Hupeh & Szechwan,” without specific locality, in 1885–1888, *Henry 6083* (BH (photo), BM, E, GH (2 sheets), MO, NY, P, US (2 sheets)). **Hebei:** Fuping-hsien, alt. 1275 m, 30 Aug. 1934, *Liou 3509* (PE). **Hubei:** Shennongjia Forest District, along the trail between Hongriwan Construction Camp and Qiujiaping, alt. 1200–1400 m, roadside slope in forest; 2 Sep. 1980, *Bartholomew et al. 586* (A); Shennongjia Forest District, vicinity of Qiujiaping, alt. 1440–1650 m, in mature, mixed deciduous-broad leaved evergreen-coniferous forest, on steep slope, 3 Sep. 1980, *Bartholomew et al. 622* (A); Zan-lan-scian, Oct. 1913, *Silvestri 3724* (A); “western Hupeh,” without specific locality, Sep. 1901, *Wilson 2239* (NY). **Shaanxi:** Chungnan-shan, at base of steep cliff, alt. 1500 m, 2 Sep. 1933, *Wang 2067* (PE). **Shanxi:** N central China, Mt. Lean-san, in 1898, *Hugh s.n.* (BM); Hsiatschuan (1500 m) ad mtem. Yao-schan, 19 Aug. 1935, *Licent 12588* (GH); Yuan-chu, alt. 1900 m, 26 June 1959, *Pao & Yen 331* (PE); Yang-cheng, 28 July 1959, *Pao & Yen 2147* (PE). **Sichuan:** District de Tchen-Keou-Tin, bois à Heou-Pin, alt. 1600 m, 6 Sep. 1893, *Farges 1260* (NY, P).

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